# Food availability for wood turtles (*Glyptemys insculpta*) in managed and natural woodlands

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## Introduction

Wood turtles are listed as threatened by the state of Minnesota, and are a species of management concern. Declines in their populaCon have been aEributed to habitat destrucCon, collecCon for the pet trade, and highway mortaliCes. A study on wood turtles was started in the spring of 2015 by UMD scienCsts and the MN DNR to assess habitat use and responses to management acCons. Turtles were fiEed with GPS units and VHF transmiEers for tracking purposes. Wood turtles are largely terrestrial and use forested areas for foraging.

Our project focuses on comparing food resources where turtles are present and in adjacent clear-cut jack pine regeneraCon areas. These areas were created by the DNR to improve turtle foraging sites. Food availability is a necessary component of a suitable habitat. Habitat quality assessments for wood turtles require studies on food resources.

**Natural forest**

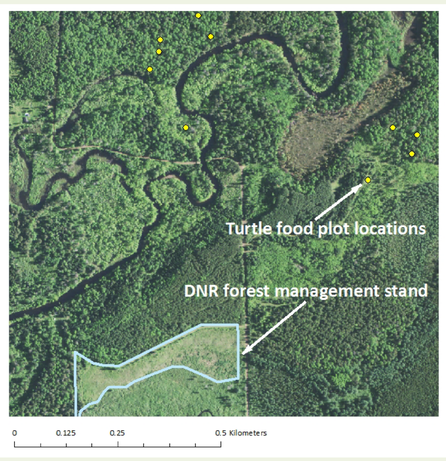
**Managed forest cleared for jack pine regeneraDon and turtle habitat restoraDon**

## Acknowledgements

- My advisor Dr. Ron Moen
- IBS graduate student Maddy Cochrane
- MN DNR – funding the wood turtle project
- UMD UROP and BURST programs

## Methods and Study Area

VHF telemetry tags were deployed in the summer of 2015. We located turtles in forests to measure foraging habitat.




We measured food availability data at 30 turtle locaCons between June 23 – August 20. Each turtle plot was paired with one random site in the closest MN DNR forest management stand.

Measurements:

- Canopy cover- measured with densiometer
- Earthworms- counted in 1 ft$^2$ (929 cm$^2$) plot after liquid mustard extracCon
- Slugs- counted in worm plot

36 ft$^2$ (3.34 m$^2$) plot

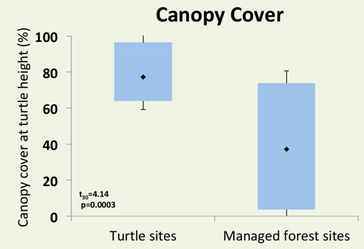
- Raspberry stems
- Ripe berries
- Mushrooms

20 in$^2$ (129 cm$^2$) plot

- Green plants with leaves within reach of turtles

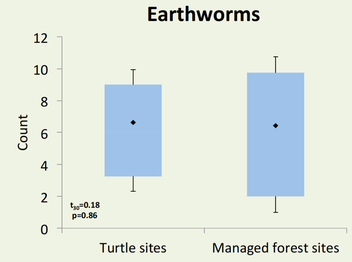
## Results

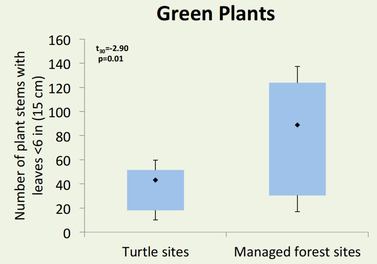
**Paired two sample for means t-tests were conducted for each food resource and canopy cover. Error bars represent SEM. Turtles were found in areas with higher canopy cover than managed areas.**




Wood turtle eaCng earthworm
Photo: Mike Schrage

**Availability of earthworms did not differ between natural and managed forested areas, while the abundance of green plants was greater in managed areas. Environmental factors (canopy cover) may be driving wood turtle habitat use patterns.**




**The number of raspberry stems, an indicator of potenDal berry availability, was greater in managed areas. The density of mushrooms was greater in natural forest areas. DensiDes of slugs and berries did not differ between the natural and managed forest areas. Wood turtles could be selecDng areas with higher mushroom densiDes.**

| | Turtle sites | | Managed forest areas | | | | |
|---|---|---|---|---|---|---|---|
| Outcome | M | SD | M | SD | n | t | p |
| Earthworm count | 7 | 5 | 6 | 6 | 30 | 0.18 | 0.86 |
| Earthworm biomass (AFDg) | 0.1 | 0.2 | 0.09 | 0.08 | 28 | 1.01 | 0.32 |
| Slugs | 0.03 | 0.2 | 0.3 | 1 | 30 | -1.39 | 0.17 |
| Raspberry stems | 1 | 4 | 5 | 8 | 30 | -2.09 | 0.05 |
| Ripe berries | 0.1 | 0.4 | 0.2 | 0.8 | 30 | -0.62 | 0.54 |
| Mushrooms | 0.5 | 1 | 0.1 | 0.5 | 30 | 2.05 | 0.05 |
| Green plants | 43 | 44 | 89 | 74 | 30 | -2.90 | 0.01 |

## Future work

- A manuscript will be submiEed for publicaCon this year.

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